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【Document Name】 Specification

【Title of the Invention】 Shape Retentive Clothing

【The technical field to which the invention belongs】

【0001】

The present invention relates to a structure for forming and maintaining the three-dimensional shape of clothing.

【Description of the Prior Art】

【0002】

Some lingerie has shape-memory wire so as to stabilize the shape of the lingerie or to adjust the form of one's body. Construction stabilizing or keeping shapes is known not only in the field of lingerie but also clothing and accessory.

【0003】

For example, with regard to an art described in the Japanese Patent Laid Open Gazette 2000-314023, the clothing has a neck part covers ears and the back of head, the neck part is inserted shape-memory alloy wires or metal wires so as to keep the neck part standing.

With regard to an art described in the Japanese Utility Model 3089123, wires of shape memory alloy or metal wires are attached to the inside of a muffler as a shape retention member. Accordingly, the three-dimensional shape of the muffler can be changed freely and the shape can be kept, thereby improving the value of design.

【Summary of the Invention】

【Problems to Be Solved by the Invention】

【0004】

Especially, with regard to clothing formed from relative soft material such as knit, it is difficult to form the three-dimensional shape of the clothing and keep the shape while maintaining the feeling of the material. For example, with regard to the clothing formed from relative soft material such as knit, the neck can be turned up or rolled, but it is difficult to keep

the turned or rolled shape because of the characteristic of the material.

Then, the present invention suggests construction of shape retentive clothing whose three-dimensional shape can be changed freely and kept even if the clothing is constructed by soft material such as knit.

**【Means for Solving the Problems】**

**【0005】**

The above-mentioned problems are solved by the following means according to the present invention.

**【0006】**

As specified in claim 1, a member which is transformable and maintainable its shape is attached to the clothing.

**【0007】**

As specified in claim 2, a member which is transformable and maintainable its shape is attached to a body, a sleeve, a cuff, a neck or a pocket of the clothing.

**【0008】**

As specified in claim 3, a resin wire and/or a ceramic wire are used as the member transformable and maintainable its shape.

**【0009】**

As specified in claim 4, an end of the resin wire or the ceramic wire is turned up and covered by a cylindrical member.

**【Effect of the Invention】**

**【0010】**

The present invention constructed as the above brings the following effects.

**【0011】**

According to claim 1, the clothing can be formed three-dimensionally and kept in the shape even if the clothing is constructed by soft cloth which is hardly to retain its shape. When the clothing gets out of shape once, the clothing can be formed again easily so as to form fine state.

**【0012】**

According to claim 2, the sleeve may be formed three-dimensionally to be rolled up and the shape of the sleeve can be maintained even if the clothing is constructed by soft cloth which is hardly to retain its shape.

【0013】

According to claim 3, the ceramic wire does not rust, is not spoiled by washing, and are bendable. Furthermore, the ceramic wire hardly becomes brittle even if the wires are bended repetitively. Accordingly, the ceramic wire is more advantageous than metal wire.

【0014】

According to claim 4, the end of wire attached to the clothing is prevented from piercing cloth and projecting.

【The Best Mode of Embodiment of the Invention】

【0015】

Next, an embodiment of the present invention will be explained.

Fig. 1 is a drawing of a necked shirt as clothing concerning to an embodiment of the present invention. Fig. 2 is a drawing of the arrangement of wires attached to the necked shirt. Fig. 3 is a drawing of a T-shirt as the clothing concerning to an embodiment of the present invention. Fig. 4 is a drawing of the arrangement of wires attached to the T-shirt.

Fig. 5 is a drawing of the construction of a border line.

Fig. 6 is a drawing of the wire. Fig. 7 is a drawing of an embodiment of attaching the wire to the clothing. Fig. 8 is a drawing of the wire attached to the clothing.

Fig. 9 is a drawing of a neck to which the wire is attached. Fig. 10 is a drawing of a pocket to which the wire is attached. Fig. 11 is a drawing of a sleeve to which the wire is attached.

Fig. 12 is a drawing of trousers as the clothing concerning to an embodiment of the present invention.

【0016】

A shape retentive dress according to the present invention can be made and kept its shape without spoiling the feel of cloth constituting the dress though the cloth is soft cloth which is difficult to keep its three-dimensional shape, such as knit.

In Fig. 1, a knit shirt 10 is shown as an example of the shape retentive dress according to the

present invention. The shirt 10 is necked. Sleeves 12 are sutured to a body 11 of the shirt 10. A neck 13, a pocket 15 and a flap 15a are sutured to the body 11. In addition, as shown in Fig. 3, a knit T-shirt 40 having no neck also can be made retentive.

【0017】

The shape retentive dress is not limited to a shirt, and the present invention also can be applied to trousers or a jacket. The construction of the shape retentive dress according to the present invention can be applied to an accessory, such as a muffler, a scarf or shoes, so as to make a shape retentive accessory.

A dress material constituting the dress is not limited to knit, and another material may be used.

【0018】

As shown in Figs. 1 and 3, the shirt 10 or 40 is constructed by striped knit.

As shown in Fig. 5, the striped design is not formed by changing color of yarn used for weaving the cloth. The striped design is formed three-dimensionally by suturing main cloths 17 and sub cloths 16 which are at least two types (designs and colors) of cloths.

Each of the sub cloths 16 whose width is slightly wider than the width of the striped design is sutured to the reverse side of the main cloths 17 between two main cloths 17. Ends 17a of each of the main cloths 17 are not stitched and only cut, and are exposed to the obverse side of the dress. Because of the characteristic of knit, the ends 17a of the main cloth 17 curl up to the obverse side, whereby cubic lines are formed at the lateral border lines of the striped design.

【0019】

Wires 20, which are transformable and maintainable their shapes, are attached to suitable positions of the shirt 10 so as to obtain shape retentivity, that is, to change the three-dimensional shape of the dress freely and to keep the changed shape.

As shown in Figs. 2 and 4 for example, with regard to the necked shirt 10, the wires 20 are attached to the neck 13, a neck hole (an opening of the neck) 14, the lower portions of the sleeves 12, the lower portion of the body 11, the edge of the pocket 15 and the edge of the flap 15a. With regard to the T-shirt 40, the wires 20 are attached to the lower portions of the

sleeves 12 and the lower portion of the body 11.

【0020】

A metal wire, a resin wire, a ceramic wire or the like can be used as each of the wires 20. In this embodiment, ceramic wires are used. The ceramic wires don't rust, are not spoiled by washing, and are bendable. Furthermore, the brittleness of the ceramic wires is hardly to be reduced even if the wires are transformed continuously. Accordingly, the ceramic wires are more advantageous than metal wires.

As shown in Fig. 6, both ends 20a of each of the wires 20 are turned up. The turned parts are inserted into and fixed to resin tubes 21 respectively by hot welding. Accordingly, the ends of wires 20 attached to the cloths constituting the dress are prevented from piercing the cloths and projecting.

【0021】

The wires 20 are attached to the reverse side of the dress so as not to be exposed.

For example, as shown in Fig. 7, each of the wires 20 is inserted into a pipe formed by suturing a separate cloth 19 to the reverse side of the main cloths 17 so as to attach the wires 20 to the dress.

With regard to this embodiment, as shown in Fig. 8, the separate cloth 19 is attached to the reverse side of each of the sub cloths 16 so as to form a pipe by the separate cloth 19 and the sub cloth 16, and then the wire 20 is inserted into the pipe, thereby attaching the wires 20 to the dress.

【0022】

In addition, the wires 20 are not fixed to or weaved into the dress. The wires are attached to the dress movably within a small allowable range. That is because the dress is formed by elastic cloth, such as knit. Accordingly, unnatural contraction and creases are prevented from being generated by the expansion and contraction of the knit at the part to which the wires 20 are attached.

However, the attachment of the wires 20 is not limited thereto. The wires may be attached to the dress movably within a small allowable range by fastening some parts of the wire 20. Alternatively, it may be constructed that the edge of the main cloth 17 is turned up and the wire

20 is inserted into the turned part.

【0023】

In the vicinity of the neck 13 of the shirt 10, as shown in Fig. 9 (a), the wires 20 are attached to the peripheral edges of the neck 13 and the neck hole 14. Accordingly, as shown in Fig. 9 (b), the neck 13 is kept turned up. The shirt may be formed three-dimensionally and kept in the shape. For example, a part of the neck 13 may be bent or the neck hole 14 may be waved.

【0024】

At the pocket 15 of the shirt 10, as shown in Fig. 10 (a), the wires 20 are attached to the peripheral edges of the opening of the pocket 15 and the flap 15a. Accordingly, as shown in Fig. 10 (b), the pocket 15 may be embossed on the body 11 and formed three-dimensionally. The flap 15a may be formed three-dimensionally to be turned up. The shape of the pocket 15 or the flap 15a can be maintained.

【0025】

At each of the sleeves 12 of the shirt 10, as shown in Fig. 11 (a), the plural wires 20 are attached to the lower portion of the sleeve 12 passing over the longer direction of the sleeve. These wires 20 are circular along the peripheral direction of the sleeve. Plural wires may be attached along the peripheral direction of the sleeve. However, it is desirable to attach a circular wire along the shape of the sleeve. Accordingly, as shown in Fig. 11 (b), the sleeve 12 may be formed three-dimensionally to be rolled up. The shape of the sleeve 12 can be maintained.

【0026】

In addition, with regard to a pair of trousers 25 as a shape retentive dress, as shown in Fig. 12 (a), plural circular wires 20 are attached to the cuffs of the trousers 25. Accordingly, as shown in Fig. 12 (b), the trousers 25 constructed by soft cloth such as knit may be formed three-dimensionally to be rolled up. The shape of the trousers 25 can be maintained.

【0027】

As the above mentioned, by attaching the wires 20 to the dress, the dress can be formed three-dimensionally and kept in the shape even if the dress is constructed by soft cloth which is hardly to retain its shape. Furthermore, any treatment, such as starching, is not performed on

the surface of the cloth, whereby the feeling of the cloth is not spoiled.

Moreover, the shape retentivity of the wires 20 is not changed with the passage of time so that the three-dimensional shape of the dress is maintained. If the dress gets out of shape once, the wires 20 can be formed again easily so as to form fine state without requiring any special apparatus, tool or medicine.

**【0028】**

In Fig. 13, a fabric (knit or the like) shirt 10 is shown as an example of a product comprising cloth of cutout design. However, products to which the cloth of cutout design is adopted is not limited to shirts, trousers, jackets and another dress, and is widely applicable to cloth products such as mufflers, scarves, shoes and another accessories. As shown in Fig. 13, striped design is formed on the shirt 10. As shown in Fig. 14, the striped design of the shirt 10 is not formed by printing or changing color of yarn of cloth but is formed by plural cutout patterns 30. The cutout patterns 30 are formed three-dimensionally by suturing the main cloths 17 and the sub cloths 16 which are at least two types (designs and colors) of cloths.

**【0029】**

Each of the sub cloths 16 whose width is slightly wider than the width of the striped design is sutured to the reverse side of the main cloths 17. The sub cloth 16 appears through a cut opening 32 between the main cloths 17. The ends 17a of each of the main cloths 17, formed by forming the cut opening 32 between the main cloths 17, are not stitched and only cut, and are exposed to the obverse side of the cloth. The ends 17a of the main cloth 17 curl up and appear to the obverse side, whereby cubic lines are formed at the lateral border lines of the striped design. The curls of the ends 17a of the main cloth 17 are artless so that the border line between the main cloth 17 and the sub cloth 16 on the obverse side of the cloth is not straight but waved.

**【0030】**

The cloth material of the main cloths 17 is knit and may be sheeting, rib stitch, purl stitch, pin tuck, Rahben stitch, racked stitch, half cardigan rib stitch, full cardigan rib stitch, allow stitch, Jacquard stitch, lace, intarsia, plating, napping or the like.

In addition, the cloth material of the sub cloths 16 is not limited to knit, and may be woven

cloth or non-woven cloth. By making the cloth material of the main cloths 17 differ from that of the sub cloths 16, the cutout patterns 30 can be formed whose cloths are differ from each other in not only colors and designs but also texture.

【0031】

Next, explanation will be given on the method for forming the cutout pattern on cloth according to a flow chart in Fig. 15.

Firstly, as shown in Fig. 16 (a), the sub cloth 16 is sutured to the reverse side of the main cloth 17 (S11). By sewing the perimeter of the cut opening 32 which will be formed on the main cloth 17, the sub cloth 16 is sutured to the main cloth 17, whereby stitches 31 appearing on the obverse side of the cloth 17 are formed. A thread of the same color as the main cloth 17 may be used. Alternatively, a thread of different color from the main cloth 17 may be used so as to form decoration stitches 31.

In addition, in the case of providing the cutout patterns 30 on the shirt 10 shown in Fig. 13, the construction cloth of the shirt shaped as the shirt 10 is considered as the cloth 17, and the sub cloths 16 are sutured to the reverse side of the construction cloth.

【0032】

Next, if later-discussed fixing stitches 31a are not formed in the cutout patterns 30 (S12), the cut opening 32 is formed on the main cloth 17 by incising the main cloth 17 or cutting a part of the main cloth 17 away as shown in Fig. 16 (b) (S13).

At the time of forming the cut opening 32, a fixed width (hereinafter, referred to as “curl up margin”) of the main cloth 17 remains between a cut edge 17a of the main cloth 17 generated by the cut opening 32 and the stitch 31. Namely, the part of the main cloth 17 is cut away while leaving the curl up margin of the main cloth 17 from the stitch 31 so as to form the cut opening 32, whereby the stitch 31 is positioned outer from the perimeter of the cut opening 32 (the cut edge 17a of the main cloth 17) for the curl up margin.

The cut edge 17a of the main cloth 17 is only cut and not treated for preventing the fray (for example, stitching or gluing). The cut edge 17a of the main cloth 17 is shrunk (S15) so as to form the cutout patterns 30 on the cloth.

【0033】

As the above mentioned, the cut edge 17a of the main cloth 17 generated by forming the cut opening 32 on the main cloth 17 is not stitched and only cut. Accordingly, by forming the cut opening 32 and shrinking the cut edge 17a of the main cloth 17, the part of the main cloth 17 between the stitch 31 and the cut edge 17a (the curl up margin of the main cloth 17) curls up to the obverse side of the cloth as shown in Fig. 16 (b). The curl of the cut edge 17a is not processed compulsorily and is generated according to the characteristics of the cloth so that the curl is artless, whereby the border line between the main cloth 17 and the sub cloth 16 on the obverse side of the cloth is not straight but waved.

【0034】

Accordingly, the curl of the cut edge 17a of the main cloth 17 constitutes a decoration which makes the cutout patterns 30 individual and novel so as to make the cloth of the cutout patterns 30 loose. It is not necessary to treat the cut edge 17a for preventing the fray, whereby number of the working processes is reduced and the work becomes easy.

In addition, with regard to the curl up margin, it is preferable to adjust the area of the cut opening 32 corresponding to the cutout patterns 30. It is preferable to make the curl up margin in the same cutout pattern 30 substantially uniform. By making the curl up margin substantially uniform, the volume of the curl of the cut edge 17a of the main cloth 17 becomes substantially uniform, whereby the design becomes nice to look at.

【0035】

For example, in the case of providing the cutout patterns 30 on the shirt 10 shown in Fig. 13, a straight incision is formed at each of the parts of the main cloth 17 surrounded by the stitches 31 so as to form the cut opening 32. In the case that the width of the stripe is large, each of the parts of the main cloth 17 surrounded by the stitches 31 is cut away while leaving the curl up margin of the main cloth 17 from the stitch 31 so as to form the cut opening 32.

【0036】

With regard to the cutout patterns 30 formed as the above mentioned, the main cloth 17 is adopted as a construction cloth of a thing from which a finished product is made by providing a decoration (in the shirt 10 shown in Fig. 13, the thing constructing the form of the shirt). Accordingly, as shown in Fig. 17 for example, with regard to a shirt on which a picture is

printed, a striped design which divides the picture is formed at the part of the picture of the shirt by the cutout patterns 30. Instead of printing a part of the picture on each of the parts between the stripes of the striped design, the picture is divided by the cubic stripes, whereby the picture and the striped design coexist conspicuously in the same area.

As shown in Fig. 18 for example, it is easy to form the cutout patterns 30 passing through a seam between the sleeve and the body of the shirt. In this case, as shown in Fig. 19 (a), the main cloth 17 is adopted as a construction cloth constructing the form of the shirt. The sub cloth 16 is sutured to the sleeve 12 and the body 11 continuously, and the stitch 31 is provided around the cut opening 32 to be formed. Then, as shown in Fig. 19 (b), the part of the main cloth surrounded by the stitch 31 is cut away while leaving the curl up margin of the main cloth 17 from the stitch 31 so as to form the cut opening 32, and the cut edge 17a is shrunk. Accordingly, the part of the main cloth 17 between the stitch 31 and the cut edge 17a leaved as the curl up margin curls up to the obverse side so as to form the cutout pattern 30.

In addition, the design formed by the cutout patterns 30 is not limited to the continuous line design. As shown in Fig. 20 for example, the cutout pattern 30 may be constructed by divided lines.

### 【0037】

Explanation will be given on the method for forming the cutout patterns 30 in this case on cloth according to a flow chart in Fig. 15. Firstly, as shown in Fig. 21 (a), the sub cloth 16 is sutured to the reverse side of the main cloth 17 (S11).

Next, as shown in Fig. 21 (b), the fixing stitch 31a is formed in each of areas surrounded by the stitches 31 (S14). In this embodiment, the fixing stitches 31a are X-like shaped. However, the fixing stitches 31a may be polygonal, circular or dot-like shaped.

Finally, as shown in Fig. 21 (c), the part of the main cloth 17 surrounded by the stitch 31 and the fixing stitches 31a is cut away while leaving the curl up margin of the main cloth 17 from the stitch 31 so as to form the cut opening 32 (S13). The cut opening 32 is formed accordingly, and then the cut edge 17a is shrunk (S15). Accordingly, the part of the main cloth 17 between the stitch 31 and the cut edge 17a curls up to the obverse side so as to form the cutout pattern 30.

In addition, the design formed by the cutout patterns 30 is not limited to the line design.

As shown in Fig. 22 for example, the cutout pattern 30 may be wedge-like cross shaped.

In this case, as shown in Fig. 23 (a), the sub cloth 16 is sutured to the reverse side of the main cloth 17, and then the stitch 31 is provided around the cut opening 32 to be formed.

Subsequently, as shown in Fig. 23 (b), the part of the main cloth 17 surrounded by the stitch 31 is cut away while leaving the curl up margin of the main cloth 17 from the stitch 31 so as to form the cut opening 32. Presently, the part of the main cloth 17 between the stitch 31 and the cut edge 17a of the cut opening 32 curls up to the obverse side so as to form the wedge-like cross shaped cutout pattern 30. For example, the cutout pattern 30 may be polygonal, circular, heart-like, clover or the like.

### 【0038】

By the above-mentioned method for forming the cutout pattern, the cutout pattern 30 with free shape can be formed easily on cloth.

With regard to the cutout pattern 30 formed as the above, the sub cloth 16 appears through the cut opening 32 formed on the main cloth 17, and the cubic line is formed at the peripheral edge of the cut opening 32 by the curl of the curl up margin remained between the cut edge 17a of the main cloth 17 and the stitch 31. Namely, the cutout pattern 30 is formed by the border line between the main cloth 17 and the sub cloth 16 and the cubic line formed on the border line. The cubic line formed on the border line is curved and artless so that the main cloth 17 and the sub cloth 16 are felt not to be divided straight but to be switched curvedly gradually, whereby the design is felt looser.

### 【0039】

Now, conventionally, with regard to a dress formed by woven cloth such as a jean, there is well known a dress design that the cut edge of cloth is not stitched and is exposed to the obverse of the cloth so as to use the fraying edge as a decoration. With regard to a dress formed by fabric such as a T-shirt, there is well known a dress design that sutured parts in the underarm, sleeve or the like is exposed to the obverse so as to use the rolling edge as a decoration.

These dress designs using the edge as a decoration looks loosely and achieve wide

acceptance by the young mainly.

**【0040】**

Conventionally, there is well known a decorative art that a part of a cloth is cut away and another cloth is exposed through the cut part.

For example, the Japanese Utility Model Laid Open Gazette Hei. 5-60314 discloses a method to expose another cloth through the opening of the cut cloth for constructing a cubic design on the cloth. In this method, the opening for forming the cubic design is provided on a sheet body (cloth or the like). A design chip on which the design is provided and filled with filler so as to be uneven cubicly is stuck on the reverse side of the opening, whereby the design chip with three-dimensional shape appears through the opening of the sheet body.

**【0041】**

The Japanese Utility Model Laid Open Gazette Hei. 5-60314 expresses the effect that the edge of the opening of the sheet body is covered by the puff of the design chip and is not exposed though the design chip is attached to the reverse side of the sheet body, whereby the design becomes nice to look at. Namely, the cut edge of the cloth on the edge of the opening does not function as a decoration and exists only as a border line between the cloths.

**【0042】**

Accordingly, as the above mentioned, by using the method for forming the cutout pattern comprising the process of forming the stitch surrounding the part to be cut away by suturing the sub cloth to the reverse side of the main cloth and the process of cutting the main cloth surrounded by the stitch while remaining the fixed roll up margin from the stitch, the cutout pattern with free shape can be formed easily on cloth. With regard to the formed cutout pattern, the sub cloth appears to the obverse side of the cloth through the cut opening formed on the main cloth, and the cubic line is formed at the peripheral edge of the cut opening by the curl of the curl up margin of the main cloth. Furthermore, it is not necessary to treat the cut edge of the main cloth for preventing the fray, whereby number of the working processes is reduced and the work becomes easy.

**【0043】**

By constructing the main cloth from fabric and constructing the sub cloth from fabric,

woven cloth or non-woven cloth, the curl up margin of the main cloth curls up so as to form the cubic line. The cubic line formed on the border line is curved and artless. The main cloth is construction cloth of a thing from which a finished product is made by providing a decoration. Accordingly, the cutout pattern can be formed which divides a picture provided on the cloth. Furthermore, it is easy to form the continuous cutout pattern on the sutured part of the dress or the like.

【0044】

The cloth with the cutout pattern comprises the cut opening formed on the main cloth, the stitch provided outer from the perimeter of the cut opening for the fixed curl up margin, the sub cloth appearing through the cut opening, and the curl of the curl up margin. Accordingly, the curl of the cut edge of the main cloth constitutes a decoration which makes the cutout pattern individual and novel so as to make the cloth of the cutout pattern loose. By constructing the main cloth from fabric and constructing the sub cloth from fabric, woven cloth or non-woven cloth, the cubic line formed by the curl of the remained curl up margin of the main cloth is curved and artless, thereby being loose.

【Brief Description of the Drawings】

【0045】

【Fig. 1】

It is a drawing of a necked shirt as a dress concerning to an embodiment of the present invention.

【Fig. 2】

It is a drawing of the arrangement of wires attached to the necked shirt.

【Fig. 3】

It is a drawing of a T-shirt as the dress concerning to an embodiment of the present invention.

【Fig. 4】

It is a drawing of the arrangement of wires attached to the T-shirt.

【Fig. 5】

It is a drawing of the construction of a border line.

【Fig. 6】

It is a drawing of the wire.

【Fig. 7】

It is a drawing of an embodiment of attaching the wire to the dress.

【Fig. 8】

It is a drawing of the wire attached to the dress.

【Fig. 9】

It is a drawing of a neck to which the wire is attached.

【Fig. 10】

It is a drawing of a pocket to which the wire is attached.

【Fig. 11】

It is a drawing of a sleeve to which the wire is attached.

【Fig. 12】

It is a drawing of trousers as the dress concerning to an embodiment of the present invention.

【Fig. 13】

It is a drawing of the shirt on which cutout patterns are formed.

【Fig. 14】

It is a macrograph of the cutout pattern.

【Fig. 15】

It is a flow chart of the method for forming the cutout pattern.

【Fig. 16】

It is a drawing explaining the method for forming the cutout pattern.

【Fig. 17】

It is a drawing of the shirt on which the cutout patterns dividing a picture are formed.

【Fig. 18】

It is a drawing of the cutout patterns formed over the sleeves and the body.

【Fig. 19】

It is a drawing explaining the method for forming the cutout pattern over the sleeves and the

body.

【Fig. 20】

It is a drawing of the cutout patterns each of which is formed to be divided lines.

【Fig. 21】

It is a drawing explaining the method for forming the cutout pattern formed to be divided lines.

【Fig. 22】

It is a drawing of the cross shaped cutout pattern.

【Fig. 23】

It is a drawing explaining the method for forming the cross shaped cutout pattern.

【Description of Notations】

【0046】

- 10 a shirt
- 11 a body
- 12 a sleeve
- 13 a neck
- 14 a neck hole
- 15 a pocket
- 20 a wire
- 21 a tube